WHAT IS CLAIMED IS:
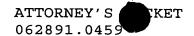
1. An apparatus for enabling multiple protocol communication over a network, comprising:

a first circuit operable to communicate first signals in a first frequency band using a first data protocol and to attenuate second signals in a second frequency band using a second data protocol, the first data protocol supporting a first modulation technique and a second modulation technique; and

a second circuit operable to communicate the second signals in the second frequency band using the second data protocol.

2. The apparatus of Claim 1, wherein the first circuit has a load impedance in the first frequency band between a first value associated with the first modulation technique and a second value associated with the second modulation technique.

3. The apparatus of Claim 1, wherein the first circuit has a load impedance in the first frequency band approximately equal to 135Ω, the load impedance being between a first value associated with the first modulation technique and a second value associated with the second modulation technique, the first value approximately equal to 130Ω and the second value approximately equal to 145Ω.

4.   The apparatus of Claim 1, wherein the first circuit is a multistage low-pass filter comprising a plurality of stages, each stage contributing a substantially similar frequency roll-off.

5

5.   The apparatus of Claim 1, wherein the first circuit is a multistage low-pass filter comprising a plurality of stages, each stage contributing approximately 40dB frequency roll-off below 100KH$_z$.

10

6.   The apparatus of Claim 1, further comprising:

an input port coupled to the first and second circuits, the input port operable to couple to a network;

a first output port coupled to the first circuit,

15   the first output port operable to communicate the first signals in the first frequency band using the first data protocol; and

a second output port coupled to the second circuit, the second output port operable to communicate the second

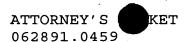20   signals in the second frequency band using the second data protocol.

7. The apparatus of Claim 6, wherein the first circuit is a multistage low-pass filter comprising:

a first stage coupled to the input port;

a second stage coupled to the first stage;

5   a third stage coupled to the second stage; and

a fourth stage coupled between the third stage and the first output port, the first, second, third and fourth stages comprising:

a first inductive element;

10   a second inductive element coupled in parallel to the first inductive element;

a third inductive element coupled in series to the first inductive element; and

a capacitive element coupled in series between 15 the third inductive element and the second inductive element;

the third inductive element and the capacitive element shared by the second and third stages; and

the first inductive element operable to couple 20 to a tip wire of a twisted pair line and the second inductive element operable to couple to a ring wire of the twisted pair line.

8. The apparatus of Claim 7, wherein the first and 25 fourth stages further comprise a resistive element coupled in series between the first and third inductive elements.

9. The apparatus of Claim 6, wherein the second circuit is a DC-decoupled pass filter, the DC-decoupled pass filter comprising:

a first capacitive element coupled in series between the input port and the second output port;

a second capacitive element coupled in series between the input port and the second output port; and

such that the first capacitive element is operable to couple to a tip wire of a twisted pair line the second capacitive element is operable to couple to the ring wire of the twisted pair line.

10. The apparatus of Claim 1, wherein the first circuit is an eighth order low-pass filter having a cutoff frequency of approximately $100KH_z$.

11. The apparatus of Claim 1, wherein the first data protocol is ISDN and the second data protocol is XDSL.
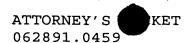
12. The apparatus of Claim 1, wherein:

the first frequency band comprises a range within approximately $25KH_z$ to approximately $80KH_z$; and

the second frequency band comprises a range within approximately $125KH_z$ to approximately $1.1 MH_z$.

13. The apparatus of Claim 1, wherein:

the first modulation technique is 4B3T; and
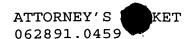
the second modulation technique is 2B1Q.

14. A circuit for enabling multiple protocol communication over a network, comprising:

a multi-stage low-pass filter operable to communicate ISDN signals in a first frequency band

5 supporting a first modulation technique and a second modulation technique and attenuate XDSL signals in a second frequency band, the low-pass filter having a load impedance in the first frequency band approximately between a first value associated with the first

10 modulation technique and a second value associated with the second modulation technique; and

a high-pass filter operable to communicate the XDSL signals in the second frequency band.

15 15. The circuit of Claim 14, wherein the load impedance of the low-pass filter is approximately equal to 135Ω, the load impedance being between the first value associated with the first modulation technique and the second value associated with the second modulation

20 technique, the first value approximately equal to 130Ω and the second value approximately equal to 145Ω.

16. The circuit of Claim 14, wherein the multistage low-pass filter comprises a plurality of stages, each

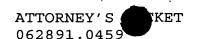25 stage contributing a substantially similar frequency roll-off.

17. The circuit of Claim 14, wherein the multistage low-pass filter comprises:

a first stage;

a second stage coupled to the first stage;

5 a third stage coupled to the second stage; and

a fourth stage coupled to the third stage, the first, second, third and fourth stages comprising:

a first inductive element;

a second inductive element coupled in parallel

10 to the first inductive element;

a third inductive element coupled in series to the first inductive element;

a capacitive element coupled in series between the third inductive element and the second inductive

15 element; and

such that the second and third stages share the third inductive element and the capacitive element.
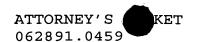

18. The circuit of Claim 17, wherein:

20 the first and fourth stages further comprise a resistive element coupled in series between the first inductive element and the third inductive element.

19. The circuit of Claim 18, wherein:

25 the first, second and third inductive elements comprise inductors of between approximately $20\mu H$ to approximately $150\mu H$;

the capacitive element comprises a capacitor of between approximately $12\mu F$ to approximately $15\mu F$; and

30 the resistive element comprises a resistor of between approximately 10Ω to approximately 15Ω.

20. The circuit of Claim 14, wherein the high-pass filter comprises:

a first capacitive element; and

5 a second capacitive element coupled in parallel with the first capacitive element.

21. The circuit of Claim 20, wherein the first and second capacitive elements comprise capacitors 10 approximately of 47pF.

22. The circuit of Claim 14, wherein:

the first frequency band comprises a range within approximately 25KH$_z$ to approximately 80KH$_z$; and

15 the second frequency band comprises a range within approximately 125KH$_z$ to approximately 1.1 MH$_z$.

23. The circuit of Claim 14, wherein:

the first modulation technique is 4B3T; and

20 the second modulation technique is 2B1Q.

24. A method for enabling multiple protocol communication over a network, comprising:

receiving an input signal from a network, the input signal having a first component associated with a first data protocol and a second component associated with a second data protocol, the first data protocol supporting a first modulation technique and a second modulation technique;

communicating a first signal in a first frequency band comprising the first component to a first communications device through a first output port, the first output port having a load impedance in the first frequency band approximately between a first value associated with the first modulation technique and a second value associated with the second modulation technique; and

communicating a second signal comprising the second component in a second frequency band to a second communications device through a second output port.

25. The method of Claim 24, wherein the load impedance of the first output port is approximately equal to 135Ω, the load impedance being between the first value associated with the first modulation technique and the second value associated with the second modulation technique, the first value approximately equal to 130Ω and the second value approximately equal to 145Ω.

26. The method of Claim 24, wherein the first data protocol is ISDN and the second data protocol is XDSL.

27. The method of Claim 24, wherein:

the first frequency band comprises a range within approximately 25KH$_z$ to approximately 80KH$_z$; and

the second frequency band comprises a range within

5   approximately 125KH$_z$ to approximately 1.1MH$_z$.

28. The method of Claim 24, wherein:

the first transport mechanism is 4B3T; and

the second transport mechanism is 2B1Q.

10

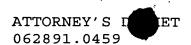29. The method of Claim 24, wherein:

the first communications device is an ISDN telephone; and

the second communications device is an XDSL router.

15

30. An apparatus for enabling multiple protocol communication over a network, comprising:

means for receiving an input signal from a network, the input signal having a first component associated with 5 a first data protocol and a second component associated with a second data protocol, the first data protocol supporting a first modulation technique and a second modulation technique;

means for communicating a first signal in a first 10 frequency band comprising the first component to a first communications device through a first output port; and

means for communicating a second signal in a second frequency band comprising the second component to a second communications device through a second output 15 port.

31. The apparatus of Claim 30, wherein the first output port has a load impedance in the first frequency band approximately between a first value associated with 20 the first modulation technique and a second value associated with the second modulation technique.

32. The method of Claim 30, wherein the first output port has a load impedance in the first frequency 25 band approximately equal to 135Ω, the impedance being between a first value associated with the first modulation technique and a second value associated with the second modulation technique, the first value approximately equal to 130Ω and the second value 30 approximately equal to 145Ω.

33. The apparatus of Claim 30, wherein the means for communicating the first signal in the first frequency band is a multistage low-pass filter comprising a plurality of stages, each stage contributing a

5   substantially similar frequency roll-off.

34. The apparatus of Claim 30, wherein the means for communicating the second signal in the second frequency band is a DC-decoupled pass filter.

10

35. The apparatus of Claim 30, wherein the first data protocol is ISDN and the second data protocol is XDSL.

15   36. The apparatus of Claim 30, wherein:

the first frequency band comprises a range within approximately $25KH_z$ to approximately $80KH_z$; and

the second frequency band comprises a range within approximately $125KH_z$ to approximately $1.1MH_z$.

20

37. The apparatus of Claim 30, wherein:

the first data protocol is ISDN and the second data protocol is XDSL; and

the first modulation technique associated with ISDN

25   is 4B3T and the second modulation technique associated with ISDN is 2B1Q.